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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,481	04/23/2001	Axel Noethe	1-15247	7474

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EXAMINER	
MCDONALD, RODNEY GLENN	
ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 03/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/763,481	NOETHE ET AL.	
	Examiner	Art Unit	
	Rodney G. McDonald	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 November 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-26 and 29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-26 and 29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 14-26 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wandke (DE 43 05 414 A1) in view of Giron (U.S. Pat. 6,277,523).

Wandke teach coating a substrate with a metal oxide layer especially a stannic oxide layer, in a vacuum in which a corresponding metal target is inserted into a corresponding chamber and eroded, and this erosion coats the substrate, whereby an

oxygen-containing plasma arising from a corresponding basic gas mixture is created in the area between the target and substrate. (Page 1)

The problem is solved according to the invention using the initially-described coating procedure by using a balanced oxidizing and reducing basic gas mixture consisting of at least 20 percent by volume oxygen, hydrogen and a gaseous hydrocarbon or halogenated hydrocarbon in the coating procedure. (Page 1)

It is also advantageous when the described mixture also contains 5-40 percent by volume argon. (Page 1)

Examples of effective gas mixtures have the following compositions:

20-30 percent by volume H_2, 20-50 percent by volume O_2, 20-30 percent by volume hydrocarbons or fluorocarbons with the remainder argon. (Page 2)

The figure shows a block diagram of a sputtering system according to the invention; in particular, an associated sputtering chamber 1 is shown. A substrate 2, e.g. a glass pane, is on the floor of the sputtering chamber. Opposite the glass pane in the sputtering chamber is a negatively poled target 3 (e.g. consisting of pure tin) on a holder 4. A gas supply 5 and a gas exhaust 6 are connected to the chamber. Also on the side of the chamber is an anode 7 consisting of steel or copper that is required for the ion stream (sputtering effect). (Page 2)

The flat glass workpiece is coated with a stannic oxide layer as follows: Tin atoms are knocked out of the intended target 3 by a stream of ion from the target, oxidize in the oxygen-containing atmosphere in the sputtering chamber to form SnO, and are deposited on the substrate 2, i.e., the glass surface. Usually the SnO layer

forms the base layer of a multilayer system applied on the glass. The ***pressure*** during formation of such a layer is approximately ***0.01-20 mbar***, which is set by suitably feeding and removing the treatment gas by the corresponding devices 5 and 6. (Page 2 and 3) The gaseous atmosphere inherently will reduce the blind charge.

The differences between Wandke and the present claims is that the hydrocarbon being saturated is not discussed, the saturated hydrocarbon being one of methane, ethane, propane or butane is not discussed, the volumetric ratio of added hydrocarbon to added oxygen is not discussed, the volumetric ratio of added noble gas to oxygen is not discussed, the tin oxide layer being electrochromic is not discussed, the target being tungsten is not discussed, the target containing molybdenum, titanium, cerium, vanadium and/or zirconium is not discussed and the thickness of the electrochromic layer is not discussed.

Wandke's "gaseous hydrocarbons" encompass saturated hydrocarbons such as methane, ethane, propane or butane and therefore teach applicant's claim limitations. (See Wandke discussed above)

Wandke disclose utilizing 20 percent O_2 and 20 percent hydrocarbon this is in a ratio of hydrocarbon to oxygen of 1:1. (See Wandke discussed above)

Wandke disclose 5-40 percent Ar and 20-50 percent O_2 this range allows for a ratio of argon to oxygen of 1:1. (See Wandke discussed above)

Giron teach an inhibited ***electrochromic*** layer of $\boldsymbol{WO_3}$, Nb_2O_3, $\boldsymbol{SnO_2}$, Bi_2O_3, $\boldsymbol{TiO_2}$, $\boldsymbol{V_2O_5}$, hydrogenated nickel oxide or MoO_3 material, which exists in a decolored or only slightly, colored state. (Column 16 lines 10-22)

All the oxide-based layers are obtained by this technique using a metal target, but in a reactive atmosphere containing oxygen. (Column 9 lines 37-40) Since Giron teach utilizing a metal target to deposit the corresponding metal oxide it would be obvious to utilize targets containing tungsten, molybdenum, titanium, cerium, vanadium and/or zirconium.

Giron teach a layer of electrochromic material based on tungsten oxide of 350 nm thickness. (Column 10 lines 11-12)

The motivation for depositing electrochromic layers utilizing targets of metals for depositing the particular compositions of the layers in particular atmospheres at particular thicknesses by sputtering is that it allows for simplifying the method of manufacturing of the electrochromic devices. (Column 2 lines 28-32)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Wandke by depositing electrochromic layers utilizing targets of metals for depositing the particular compositions of the layers in particular atmospheres at particular thicknesses by sputtering as taught by Giron because it allows for simplifying the method of manufacturing of the electrochromic devices.

Claims 14-26 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giron (U.S. Pat. 6,277,523) in view of Wandke (De 43 05 414 A1).

Giron is discussed above and all is as applies above. (See Giron discussed above) The oxide layer films are obtained using a metal target, sputtering in argon but

in a reactive atmosphere containing oxygen and optionally hydrogen and/or water vapor. (Column 9 lines 37-40)

The differences between Giron and the present claims is the utilization of gaseous hydrocarbons for sputtering, the hydrocarbon being saturated is not discussed, the saturated hydrocarbon being one of methane, ethane, propane or butane is not discussed, the volumetric ratio of added hydrocarbon to added oxygen is not discussed, the volumetric ratio of added noble gas to oxygen is not discussed and the total pressure is not discussed.

Wandke is discussed above and all is as applies above. (See Wandke discussed above)

Wandke's "gaseous hydrocarbons" encompass saturated hydrocarbons such as methane, ethane, propane or butane and therefore teach applicant's claim limitations. (See Wandke discussed above)

Wandke disclose utilizing 20 percent O_2 and 20 percent hydrocarbon this is in a ratio of hydrocarbon to oxygen of 1:1. (See Wandke discussed above)

Wandke disclose 5-40 percent Ar and 20-50 percent O_2 this range allows for a ratio of argon to oxygen of 1:1. (See Wandke discussed above)

Wandke's total pressure is 0.01 to 20 mbar. (Page 2 and 3)

The motivation for utilizing a hydrocarbon in the sputtering atmosphere at particular ratios and particular pressures during sputtering of the metal oxide is that it allows for inhibiting the target from being coating with oxides which influences the coating rate. (Page 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Giron by utilizing a hydrocarbon in the sputtering atmosphere at particular ratios and particular pressures during sputtering of metal oxides as taught by Wandke because it allows for inhibiting the target from being coated with oxides which influences the coating rate.

Response to Arguments

Applicant's arguments filed November 24, 2003 have been fully considered but they are not persuasive.

In response to the argument that utilizing the teachings of Wandke in no way enables one skilled in the art to foresee the deposition of metal oxides other than tin oxides, it is argued that the secondary reference to Giron teach other metal oxides along with tin oxide that allow one of ordinary skill in the art to envisage deposition of other metal oxides utilizing Wandke's process conditions since the metal oxides including tin oxide are recognized by Giron as electrochromic coatings. (See Wandke and Giron discussed above)

In response to the argument that the present invention does not use hydrogen in gaseous molecular form but utilizes hydrogen ions, it is argued that the requirement for "hydrogen ions" has been removed from the claims. Therefore, whether Wandke utilize hydrogen ions or molecular ions moot. It should be recognized that Applicant does not require hydrogen gas or molecular hydrogen for the claimed invention. (See Wandke discussed above)

In response to the argument that the atmosphere containing a hydrocarbon is not suitable for the materials taught by Wandke, it is argued that Wandke require a gaseous hydrocarbon on Page 1. (See Wandke Page 1)

In response to the argument that stannic oxide is not a suitable electrochromic material where lithium ions are utilized, it is argued that the claims do not require lithium ion in the production of the film and that tin oxide is a suitable electrochromic coating when concerned with hydrogen ions. (See Giron discussed above)

In response to the argument that one would not look to Giron's electrochromic coatings for inclusion in a nonelectrochromic coating process of Wandke, it is argued that Wandke's process is suitable for depositing an electrochromic coating of tin oxide. Tin oxide is electrochromic as recognized by Giron. Therefore one would look to Wandke's coating process to produce electrochromic coatings. (See Wandke and Giron discussed above)

In response to the argument that one skilled in the art would not utilize the atmosphere of Wandke in the electrochromic process of Giron because there would be loss or degradation of electrochromic properties, it is argued the Wandke recognize the benefit of utilizing an atmosphere containing hydrocarbon during the sputtering of a metal oxide. The benefit for incorporating the hydrocarbon is that it prevents oxidation of the target surface which effects the coating rate. (See Wandke discussed above)

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
February 24, 2004